



ORNL-HTML / PUI Collaborations: Example at Villanova University

Donna M. Omiatek,¹ Susan D. Thai,¹ Carol A. Bessel,¹
Lawrence F. Allard,² Douglas A. Blom,²
and Jane Y. Howe²

¹Department of Chemistry, Villanova University

²High Temperature Materials Laboratory, Oak Ridge National Laboratories



ORNL-HTML

The High Temperature Materials Laboratory (HTML) at Oak Ridge National Laboratory (ORNL) is a national user facility designed to support the development of advanced materials.

Sponsored by the U.S. Department of Energy (DOE) Office of Transportation Technologies in the Office of Energy Efficiency and Renewable Energy (EE/ER).

ORNL-HTML User Centers

Materials Analysis User Center (MAUC)-

Electron microscopy and surface chemical analysis (e.g. Auger spectroscopy) to determine structure, surface chemistry, and microstructure at the atomic level.

Machining, Inspection and Tribology User Center (MITUC)-

Investigate machining and grinding processes as applied to hard materials such as ceramics and special alloys.

Mechanical Characterization and Analysis User Center (MCAUC)-

Fiber-matrix interactions in both metals and ceramic matrix composites such as fracture toughness, tensile strength, flexure strength and tensile creep under high temperature or controlled atmosphere.

Diffraction User Center (DUC)-

X-ray and neutron diffractometers for high temperature materials.

Residual Stress User Center (RSUC)-

X-ray and neutron diffraction to measure residual stress and texture in and near the surface of ceramics and alloys.

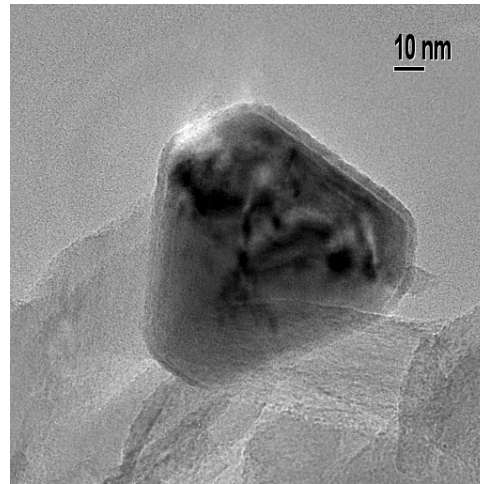
Thermography and Thermophysical Properties User Center (TTPUC)-

Thermal stability and diffusion, expansion and thermal conductivity of materials.

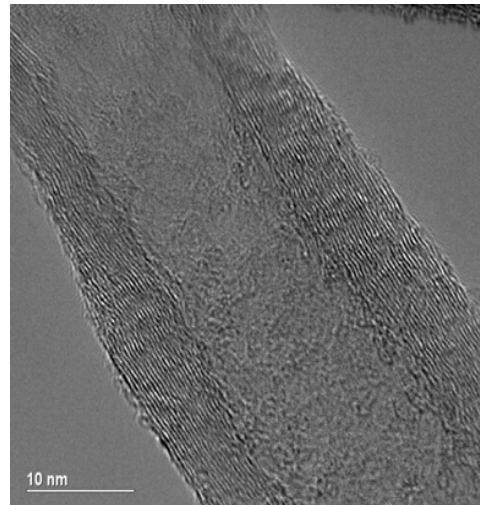
Examination of Metal Growth Catalysts and their Corresponding CNF



Dr. Larry Allard calibrating the Hitachi HF-2000 FEG AEM.



The metallic growth catalyst used in the production of 'ribbon-type' carbon nanofibers.

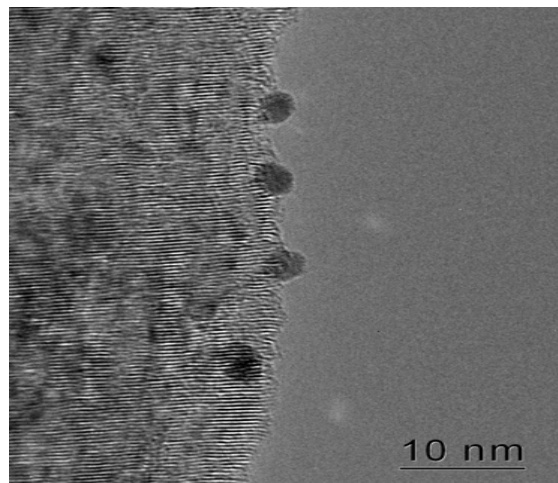


TEM images of CNF grown from Fe:Ni (6:4) catalyst prepared at 400 °C calcination / 500 °C reduction.

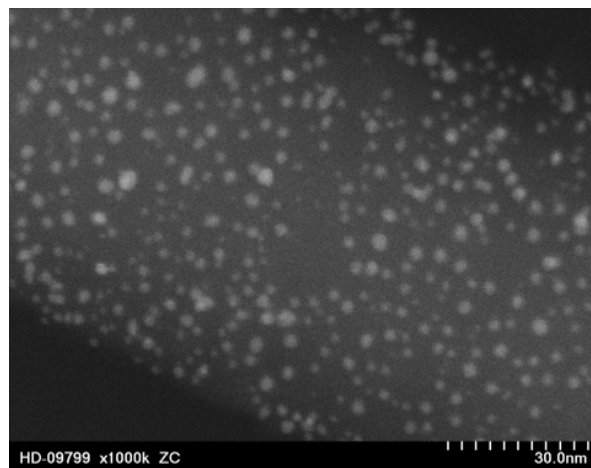
Examination of CNF-Supported Platinum Catalysts for Methanol Electrooxidation



Dr. Doug Blom on the Hitachi HF-2000 FEG STEM working with a remote user.



Pt catalyst particles dispersed on the surface of a carbon nanofiber (CNF).



Z-contrast STEM image of 5 wt% Pt support on a CNF.



Point of Contact for ORNL/HTML (MAUC)

Dr. Larry Allard
Oak Ridge National Laboratory
Phone: 865-574-4981
Email: allardfjr@ornl.gov

Proposal forms can be downloaded
from: <http://www.html.ornl.gov>



Acknowledgements

This material is based upon work supported by the National Science Foundation under Grant No. 0416040.

Research sponsored by the Asst. Secretary for Energy Efficiency and Renewable Energy, Office of Transportation Technologies, as part of the High Temperature Materials Laboratory User Program, Oak Ridge National Laboratory, managed by UT-Battelle LLC for the U.S. Dept. of Energy under contract number DE-AC05-00OR22725.